

DOE-ID NEPA CX DETERMINATION

Idaho National Laboratory

SECTION A. Project Title: Transient Reactor Test (TREAT) Facility Irradiations for LANL

SECTION B. Project Description and Purpose:

The Los Alamos National Laboratory (LANL) Super Cell and Laser Diode test assesses the effect of acute high radiation dose on electronic device performance. The Transient Reactor Test (TREAT) facility at Idaho National Laboratory (INL) supplies the neutron source. The proposed action performs neutronic characterization and process demonstration to improve understanding on how acute high radiation dose effects electronic device performance.

LANL will supply the Super Cell or Laser Diode test article to INL. INL will load the Super Cell or Laser Diode test article into the Broad Use Specimen Transient Experiment Rig (BUSTER) for the transient test in TREAT.

The tasks for this project include the following:

1. LANL will fabricate and deliver the Super Cell or Laser Diode test article along with instrumentation and flux dosimetry. LANL will supply hanging and fastening hardware and lead routing cable.
2. LANL will deliver material certifications and drawings of the test hardware to enable TREAT reactor engineering staff to complete worth calculations. The hardware contains no hazardous materials that would require containment and experiment safety package.
3. INL QA will review and accept the hardware.
4. INL staff will create process documentation to permit irradiation (e.g. data package, installation drawing, test plan).
5. INL staff will assemble the Super Cell or Laser Diode test article into the irradiation assembly using existing hardware.
6. LANL staff will deliver any special purpose signal processing and data acquisition equipment for desired instrumentation and be present to help set up and operate this equipment.
7. INL will perform the irradiation in TREAT using a maximum pulse energy in the MARCH full slotted core. Note that the project may perform a couple of lower power pulses to characterize core response prior to the max pulse.
8. INL will remove and store the test article for short-lived isotope decay, and then ship to LANL in an appropriate container.
9. INL will provide transient power data from plant instrumentation and flux data from relevant in-core neutron detectors present as concurrent irradiations and prepare a final report documenting the results.
10. INL will characterize dosimetry using gamma spectroscopy equipment.

SECTION C. Environmental Aspects or Potential Sources of Impact:

Air Emissions

The proposed action has the potential to generate radiological emissions from irradiation in TREAT. Air emissions are anticipated to be minor, and emissions from this project will not cause an increase above the currently monitored air emissions. An Air Permit Applicability Determination (APAD) would not be required.

The TREAT irradiation activities are not modifications in accordance with Idaho Administrative Procedures Act (IDAPA) 58.01.01.201 and 40 Code of Federal Regulation (CFR) 61 Subpart H. All experiments will be evaluated by Environmental Support and Services staff.

In 2019, the effective dose equivalent to the offsite maximally exposed individual (MEI) from all operations at the INL Site was calculated as .0559 mrem/yr, which is 0.5% of the 10-mrem/yr federal standard and was calculated using all sources that emitted radionuclides to the environment from the INL site. The emissions are bounded by the analysis in the 1995 EIS, which estimated the annual cumulative doses to the maximally exposed worker, offsite maximally exposed individual (MEI), and the collective population from DOE's decision to implement the preferred alternative (DOE/EIS-0203). The potential air emissions and human health impacts associated with the proposed action would be smaller than and are bounded by the impacts presented in the 1995 EIS.

Discharging to Surface-, Storm-, or Ground Water

N/A

Disturbing Cultural or Biological Resources

TREAT is over 50 years old. However, no modifications or aesthetic changes will be made to the building.

Generating and Managing Waste

Project activities have the potential to generate Low-level waste (LLW). This waste will consist of gloves, poly, and tape, etc.

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Releasing Contaminants

Air emissions have been identified above.

Using, Reusing, and Conserving Natural Resources

Waste will be diverted from the landfill to the extent practicable.

SECTION D. Determine Recommended Level of Environmental Review, Identify Reference(s), and State Justification: Identify the applicable categorical exclusion from 10 Code of Federal Regulation (CFR) 1021, Appendix B, give the appropriate justification, and the approval date.

For Categorical Exclusions (CXs), the proposed action must not: (1) threaten a violation of applicable statutory, regulatory, or permit requirements for environmental, safety, and health, or similar requirements of Department of Energy (DOE) or Executive Orders; (2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment or facilities; (3) disturb hazardous substances, pollutants, contaminants, or Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)-excluded petroleum and natural gas products that pre-exist in the environment such that there would be uncontrolled or unpermitted releases; (4) have the potential to cause significant impacts on environmentally sensitive resources (see 10 CFR 1021). In addition, no extraordinary circumstances related to the proposal exist that would affect the significance of the action. In addition, the action is not "connected" to other action actions (40 CFR 1508.25(a)(1) and is not related to other actions with individually insignificant but cumulatively significant impacts (40 CFR 1608.27(b)(7)).

References:

The irradiation described in this ECP is covered by overarching EC INL-14-024 "Research and Development Activities at the Idaho National Laboratory (INL) Site Facilities (Overarching)" which references CX B3.6 for research and development.

Justification:

Project activities in this EC are consistent with 10 CFR 1021 Appendix B to Subpart D, Categorical Exclusion B3.6 "Siting, construction, modification, operation, and decommissioning of facilities for small-scale research and development projects: conventional laboratory operations (such as preparation of chemical standards and sample analysis); small-scale pilot projects (generally less than two years) frequently conducted to verify a concept before demonstration actions, provided that construction or modification would be within or contiguous to a previously disturbed or developed area (where active utilities and currently used roads are readily accessible). Not included in this category are demonstration actions that are undertaken at a scale to show whether a technology would be viable on a larger scale and suitable for commercial deployment."

Is the project funded by the American Recovery and Reinvestment Act of 2009 (Recovery Act) Yes No

Approved by Jason Anderson, DOE-ID NEPA Compliance Officer on: 04/13/2021